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AMERICAN VETERINARY REVIEW,

MAY, 1890.

EDITORIAL.

DOCKING HORSES' TAILS.—Merely a freak of fashion—philanthropy and humanity opposed to it—their objection—another reason against it—empirical and unscientific mode of performing it—its justification when performed *secundum artem*—Massachusetts Society for the Prevention of Cruelty to Animals—New York City Courts—no regular graduate will now perform it. DR. PAUL PAQUIN AND DR. PAUL GIBIER.—One establishes the first laboratory for veterinary vaccine matter—the other establishes the first institute for the treatment of prophylaxy of rabies—the advantages that these institutions offer—the first bulletin from the Pasteur Institute of New York.

DOCKING HORSES' TAILS.—Of all the so-called “surgical” operations to which a capricious fashion has given origin, there is probably none which has encountered on the part of philanthropists and humanitarians such general and merited animadversion as the amputation or docking of the tail of the horse, and there certainly is none which more fully justifies the objections of right-thinking persons.

The objections principally and most zealously urged from this quarter have been founded on reasons both of humanity and esthetics, the former bearing specially upon the unnecessary mutilation of the animal, and the sufferings to which the victim is subjected, both during and subsequent to the operation, while the wound resulting from it is in course of healing, and to which must be added the annoyance and irritation which must follow the loss of so important a means of defence against the attacks of the swarming insects which in their season irritate and disturb him, by foraging on his sensitive skin. But there is also another reason, which from a profes-

sional standpoint possesses an equal degree of importance in the cruel and butcherly manner in which the docking is in the majority of cases performed, or we might say perpetrated. That any one possessing ordinary human feelings should allow the tail of a handsome animal to be cut off with a hatchet, in entire contempt of surgical rules and indifferent as to where the cut (or "hack") is made, and without considering the risk of leaving a projecting portion of a vertebræ protruding in the centre of the wound thus made, and left to itself to slough off after having been more or less exposed to injuries from external violence—this seems to be almost incomprehensible. Waiving the first objection for the moment, and merely considering the second from a surgical standpoint, it seems difficult to understand why, to-day, the amputation of the tail, when necessary, (for there are, at times, urgent indications for its performance) should not be performed *secundum artem*, by a careful and experienced hand, with all the benefits to be obtained from the use of local anasthaësia and by a proper operation at the point of the vertebræ, with ligation of the caudal arteries. This, with the simple dressing of the wound would place the case under conditions which would certainly obviate some of the most important of the objections now urged against the operation itself.

We are glad to learn that already in Massachusetts some offenders in this matter have received justice at the hands of the Society for the Prevention of Cruelty to Animals, and have had severe punishment meted to them for having docked the tails of a number of horses. The same thing has also recently taken place in New York city, and a decision rendered by the courts by which the operation of docking has become illegal.

We are pleased to remark, however, that amongst the persons who have subjected themselves to punishment in those last cases, we have failed to find the name of a single regular veterinarian, and we doubt if, to-day, any regular graduate in the State would perform the operation, except as we believe it ought to be done, under pathological conditions and for remedial reasons, and with the various steps above specified.

DR. PAUL PAQUIN—DR. PAUL GIBIER.—We some time since called the attention of our readers to the enterprise undertaken by Dr. Paul Paquin in the establishment of his Missouri Vaccine Laboratory for the preparation of prophylactic cultures and principally for that of the culture against anthrax, and we complimented the Doctor by assuring him of our best wishes for the success of his undertaking. While we have not received positive statistics of the results thus far accomplished by the Paquin "Vaccine" Laboratory, we are justified by private correspondence in saying that the institution is doing good work, and that very satisfactory results have already been secured. It would no doubt be of advantage to all the parties interested if a system of reports were inaugurated by which the profession might be benefited and enlightened by a knowledge of the success which has followed the use of the vaccine. The study of such reports would be of special interest to veterinarians in their practice, and would, no doubt, tend more than any other cause to induce them to test the value of the products of the laboratory.

Another student of Pasteur and one who is also familiar with his mode of preparing cultures, Dr. Paul Gibier, has recently come to our shores, and has opened a second Pasteur Institute in New York for the treatment of persons who have received injuries by the bites of rabid animals. A report of the opening of this new laboratory will be found on another page of the present issue, and our knowledge of the ability and experience of Director Gibier warrants expression of our confidence, that there can be no doubt as to the success of his undertaking. Europe may thus far have enjoyed the first benefits of the organization of these useful establishments, but thanks to the enterprise of these two gentlemen, we may now congratulate ourselves upon the fact that we are no longer obliged to look to Paris for the protection of our ruminants from a disease which has cost our breeders and cattle men so immensely, nor to cross the ocean to secure means for the rescue of friends, children and kindred from the prospect of a fearful death by the most horrid of diseases.

The first bulletin of the Pasteur Institute reads as follows:

NEW YORK PASTEUR INSTITUTE, 178 WEST 10TH STREET, Y. Y. CITY.

Dr. Paul Gibier, Director of the N. Y. Pasteur Institute, begs to inform you of the results of the preventive inoculations against hydrophobia, performed at this Institute during the month of March, 1890. The Institute was opened on the 18th of February last.

From the 20th of February to 31st of March about thirty persons came to be treated; only nine were detained: the animals who bit the others being still alive, no farther infection was therefore to be feared.

Nine persons have received the Pasteur treatment and are at present in good health.

In these cases hydrophobia was experimentally shown to exist, (inoculation of the nervous substance of the dogs to other animals, who died with the ordinary symptoms of hydrophobia) and also by this fact that in one case, a horse and in another case, a hog, bitten by the same dogs, have since died from hydrophobia.

In six other cases rabies was very probable but the dogs disappeared and their bodies were thrown away without being sent to the Institute.

The patients were 4 from New York City; 3 Long Island; 1 Maryland; 1 Arkansas, of whom five were treated gratuitously.

Moreover, in order to be protected against the fatal danger of an accidental infection during the work, Dr. Paul Gibier has inoculated himself and three of his assistants.

ORIGINAL ARTICLES.

EXAMINATION OF HORSES FOR SOUNDNESS.

By ROSCOE BELL, D.V.S.

A paper read before the Long Island Veterinary Society, April Meeting.

I know of no branch of veterinary science in which there is more clashing of professional opinion, nor one upon which careful study and observation will yield more satisfactory results, than that very profitable department of our peculiar calling, known as "Examinations for Soundness." I am very sorry for you, gentlemen, that some of the more capable members should not have undertaken to lead the discussion upon this subject, for I can only give you a rough outline of the views of some of the many writers who have had occasion to discuss it, interspersed with only a limited amount of original thought gained in the course of a short practice. I say I shall lead the discussion, for that is about all that is to

be gained from the reading of this paper, and if by some remark I can excite some of the older heads to unbosom to us younger members some of the knowledge which long experience and acute perception have bestowed upon them, I will have accomplished all that I could have hoped for, when I assumed the responsibility of undertaking so vast and so important a subject.

Each year I have become more and more convinced of the value of this branch of our profession to the community, and judging by the increased demand for such services, I am led to believe that the public are imbued with the same estimate of it. Very few gentlemen in the large cities will now purchase a valuable animal upon his own judgment or upon the representations of his dealer. They want to know from a veterinary surgeon, not only if a horse is sound, but they seek his opinion upon the conformation, disposition, and general traits of the beast. I do not wish to be understood as saying that these latter points have anything in common with our duties; but I know that our clients invariably wish our judgment upon these matters; they lean upon us for guidance in their equine purchases, and often force us to an estimate of the horse's monetary value—a thing which we should avoid wherever it is possible this side of actually offending our client. If the animal cannot pass a clean examination, they often make the issue definite by asking in so many words: "Will he do my work?" They want to know if the horse is serviceably sound. I am sorry that this is so, for I am of those who do not believe that it is an easy matter to say of this horse, "he is sound;" of that horse, "he is unsound." This could be done if we had certain laws laid down for our guidance; certain things always constituting unsoundness; other defects to be classed simply as blemishes. We all know that a certain defect in one animal may render him unfit to perform work, while the same apparent trouble in another may be no worse than an eyesore. It requires a fine discretion, an acute judgment, and long observation to do justice to the animal, and to the buyer. Nothing makes more enemies for the faithful practitioner, than examinations for soundness. A dissatisfied

dealer can often prove to an intending purchaser that this veterinarian's opinion is valueless by procuring a certificate from an equally reliable source, having a contrary verdict upon the animal's bodily condition. And each certificate may be honestly given, based upon conscientious belief. This comes from the fact that different men view the animal from different standpoints, and estimate differently upon certain conformations and conditions. A writer in the March number of the *Veterinary Journal* exemplifies this assertion by pointing out that a man who has more particularly devoted himself to the study of physiology would be more inclined to first familiarize himself with the state of the animal's health. He would inquire into the condition of the circulatory apparatus by noting its effects upon the visible mucous membranes; observing the character and speed of its movements as denoted by the pulse; he will auscultate the respiratory murmur, and note any physiological or structural abnormalities there to be met. He will look into the functional activity of the principal glands of the system; carefully take note of the character of the intestinal secretory glands, by watching the condition of the fæces; of the sudoriferous and sebaceous glands, by observing the effects of exercise for the former, and examining the condition of the coat for the latter. He obtains an idea of the quantity and quality of the renal excretion to speak for the condition of the kidneys. He will not omit to make a thorough examination of the organs of special sense, not only viewing the eye from every angle, but will bring his ophthalmoscope into requisition, to determine if there is complete transparency of the crystalline lens; if the vitrous humor is devoid of foreign floating bodies; if the retina is luminous and normal, and if there is turgescence of the choridal vessels. But, on the other hand, we find a man equally as conscientious, though more practical, who deems these details, if not absolutely non-essential, of very minor importance. He is spending his time in a much more practical way. He moves about the animal with a studied grace, and touches with a systematic and theatrical show and grave composure, his educated hand, making a few quick strokes of the neck, down the

front legs, over the fetlocks; slipping back to the rear, he dexterously manipulates the hips and the hocks. He brings down the admiration of his audience of the usual stable contingent, by a single glance at the incisor teeth, a fillip of the fingers in front of the eye to test the visionary powers of the wondering beast, and with a dig in the side he is prepared to pronounce the animal not a "roarer." With a trot up and down the street he is then ready to give his opinion to the owner as to the soundness of the animal. So these two men may observe the same defect, but it will have a different significance to each in many cases.

Again, personal experience with certain structural affections will influence an individual estimate of their significance. Those who have never met a case of sidebone, producing lameness, would be disposed to undervalue its importance, while a practitioner, observing hygroma of the hock only as a blemish, would not feel justified in sending its possessor back to his master; or he who has only found splints cool and located on the rudimentary metacarpel bone, would hesitate in dealing harshly with one situated a little anteriorly. But conversely, an examiner who is fresh from a poor result in treating such an affection as any of the foregoing, would pronounce severe judgment on such abnormalities. So there are very many reasons why two practitioners examining the same animal may differ in their estimate of the horse's worth.

We will not speak to-night of that veterinarian who becomes so expert with his "practiced eye," and "educated touch" that a careful examination is not necessary for a thorough knowledge of the horse's condition. The time has passed when a hurried glance over the stall door will reveal to the intuitive mind of the "born veterinarian" a perfect insight into the anatomical structure and physiological functions of the salable soliped. We have no patience with a man who can see in his "mind's eye" this same horse ten years hence, performing his work to the perfect satisfaction of his trusting client.

But, to the careful, painstaking, intelligent veterinary surgeon, who goes about his task in a systematic, professional

manner, allowing no point to escape him, testing every function, and using every precaution to avoid overlooking any defect, carefully weighing everything which has a bearing upon a correct and conscientious opinion upon the condition of the animal he is called upon to examine, we desire to address ourselves, and try to assist him by an interchange of views here in this society hall.

Our time is too limited to discuss the many definitions of "soundness" which are as various as the writers upon the subject are numerous. I am not willing to deny that the definition given us many years ago by Mr. Percival is not as good as any that have preceded or succeeded his contribution to veterinary jurisprudence,—so far as it goes. He says,— "Any horse which is lame, or has that about him which is likely to render him lame, is unsound." But surely, a horse may be absolutely unsound, and yet free from lameness. I should not employ the second time a doctor who allowed me to purchase an animal affected with pulmonary emphysema, simply because he was not lame.

Prof. Liautard makes a decided improvement upon this qualifying definition when he says: "An animal to be sound must be as near perfection as possible; must be free from disease likely to render him useless. We may find remains of disease, and yet he may be perfect enough to be a useful animal." I do not like that portion of his definition which says "likely to render him useless." He need not be useless to be unsound. He may be able to be useful, and yet his usefulness may be of an unsatisfactory character; and if he find "remains of disease and yet a useful animal" he is not necessarily a sound one. Possibly we may be able to arrive at a definition later on which will be the legal standard the world over.

To examine an animal thoroughly we should see him at rest and in action; we should see him hot and see him cold. When at rest in the stall, we are permitted to watch how he deportes himself; what he does, and how he does it; and especially should we note his first movements when being backed into the gangway, for I need not tell you the

significance of the symptoms which may here be displayed. Examine him in the full light. Place him squarely on his legs, devoid of every vestment save the halter. Look at him from every side, carrying in your mind whatever irregularities you may detect. From this position there are many points which you will be enabled to note. You will measure with your eye how he stands upon his legs; their contour, and the conformation of important joints and sections; in a minute you have seen if there exists a curb; if he knuckles at the fetlocks; if he "goes over" at the knees; and many other points of value to be remembered when you begin to look into the details. The more experience one has the more he becomes impressed with the value of a system in examinations. Begin at one point and dissect the live body, with care and with system, using all of your special senses. Starting at the labial muscles, examine everything of importance about the head, mouth, age, pulse, intermaxillary space, eyes, ears, parotid gland, and temporal fossa. Passing down the neck, mark its junction with the thorax, the withers, the shoulders, the anterior extremities, the vertebral column, the chest, trunk; then do for the hind legs what you have done for the front ones,—the hips, the stifle, the hock, and so on to the foot. Examine the inguinal region, feeling the condition of the scrotum, and terminating with tail and anus.

Your animal may have stood this examination with credit, and now you order him to be taken into the street. Though he may have shown no unsoundness at rest, he may develop it when thrown into action. He should be led by the halter, with possibly a foot of liberty, and handled by a hostler who knows his business. He should be trotted toward you, away from you, and in front of you, and displaying a regularity of action which only comes from the perfect working of every joint. If the defects be not in his gait, it may exist in his respiratory apparatus; or there may be abnormalities in his circulatory system. And we should not consider any examination where palpable unsoundness has not been found complete until the horse has been cooled off, after having been well heated up, and again submitted to an examination in ac-

tion. Many imperfections are brought out thus which otherwise would escape our observation.

Now what will we look for to constitute unsoundness? As stated, we will begin at the head, and look for malformations or diseases, employing all our special senses to help us. You are standing directly in front of the animal and you will note his age, which will display the natural or the artificial incisors; if he is a crib-biter; necrosis of the inferior maxilla at the interdental space, or caries of the teeth. Peering into the nostrils, we may find the pathological lesions of acute or chronic inflammation of the Schneiderian membrane; suppuration of the maxillary sinuses, necrosed bones, the ulcerations of glanders, or the petechiae of purpura hemorrhagica. Dropping the hand into the intermaxillary space, we feel its bony walls for evidences of osteo-porosis or other diseases or abnormalities; and running along the bottom of the hyoid space our hand may come in contact with the hot and painful fluctuating abscess of rhino-adenitis, or the indurated, nodulated adherent swelling of glanders. While stopping a moment here, you have an opportunity of getting the movement of the pulse as the glosso-facial artery turns around the rami of the inferior maxilla. Standing there we will examine very carefully each eye, comparing one with the other, and if our ocular inspection be not absolutely satisfactory the ophthalmoscope will be indispensable, especially so if there is suspicion of periodic ophthalmia, noting the changes in the lens, the vitrous humor, and the circulation.

Mounting to the occiput, one finger will slip into the ear for foreign bodies or neoplasms and pass back over the poll for fistula or the cicatrix of a past one. The hand then seizes the larynx in search of anatomical imperfections, and by a gentle squeeze we test its walls for ossification of the cartilages; and at the same time will be rewarded by an involuntary cough, which may reveal much that will assist us in determining the physiology of the lungs and throat. A look at the parotid region may reveal marks of setons, cicatrization of evacuated abscesses, or traces of blisters, which would give you the history of a past laryngitis. Pressure of the finger in the

jugular groove will dam the blood in a normal vein, and if the dilatation be bassilated in character we would suspect that our animal had been the subject of repeated bleeding, which may have been necessitated by such an unwonted affection as head staggers; or if dilatation does not take place, our vein may have become obliterated from previous phlebitis. It may be that the trachea is irregular or angular, which might have been produced by fracture of a ring or from the operation of tracheotomy, which we know is often followed by the complication of roaring. It would not be out of place here to feed the animal just enough to determine the absence of a jabot, and to see if mastication and deglutition are performed in a natural manner.

The hand and eye passing carefully over the withers would convince us of the absence of fistula, cysts, abscess, or diseased bone in this region; and keeping on down the vertebral column, and pressing with the fingers on arriving at the lumbar region we would expect to see our animal yield gently, as do all horses who are enjoying immunity from renal affections or whose spinal bones have not become ossified. A gross inspection of the sides of the chest may show marks of blisters, the rhythm of respiration or the double movement of heaves. While the ear, placed against the thoracic walls, will give the music of the vesicular murmur, as the air-cells fill in the whole extent of the surface of the lungs.

At the umbilicus we may find marks of hernia, and at the inguinal opening we look for the complications of castration; or if he be a stallion our mind would be at rest if we made a rectal exploration and found the internal openings of the canal alike on each side, thus doing away with the possibility of his being subject to intermittent hernia.

By scrutinizing the penis, or vulva, the tail and the anus, we are then prepared to go into a detailed examination of the extremities.

As a general rule, any lame animal is unsound; and as a rule, we will not discuss whether the lameness is acute or chronic. If he is lame at the time we examine him, he is un-

sound. There are many pathological lesions and structural changes found upon the legs of horses which will not interfere with their action, and it is just here that judgment, reason and experience will stand us in well. It would be unjust to condemn horses for defects which we know will not interfere with their usefulness, or their perfect performance of the work exacted of them.

First we will examine the front legs, and in doing so we will not be hasty. We will observe his general mode of standing; whether his legs are on a plumb-line, in advance of it, or behind it; if too wide apart; or the elbows abducted. At the scapulo-humeral articulation we would look for traces of setons or blisters, giving us the history of a past lameness; and while examining here the hand drawn over the spinatus fossa and shoulder joint would discover small tumors from collar-pressure. Possibly we have an atrophy of the muscles of this section, or malformations in the scapular region. The arm will very seldom be found the seat of disease; but at the point of the elbow we find cysts or neoplasms, which are unsightly if not unsound.

Arriving now at the forearm and knee joint, we scrutinize more closely to reinforce the opinion formed while viewing him from the side, and are careful to note if there is a tendency to weak knees, if not absolutely "sprung," and while manipulating this region we may find on the inside of the carpal joint an osseous or fibrous thickening, reminding us that at some time the animal has inflicted speedy cuts or blows, and storing this point away we are careful to note his manner of traveling to see if he has overcome that interference. Around the front of the knee the hand may feel a cicatrix from broken knee, telling us how, at some time, he had fallen upon them, but not necessarily denoting that he is a stumbler. We will find here, too, enlarged bursae, constituting a carpal thoroughpin. We have now descended to the digital region, and along the metacarpals we find splints, which are unsoundnesses in some cases, calling into functional activity the examiner's judgment and knowledge. At the back of this region we find the important tendons which bear the whole

weight of the anterior two-thirds of the trunk at certain times, and are very liable to disease, and should we discover sprains of the tendons, ligaments or sheaths, or indurations from previous inflammations, we know that sooner or later they will give way and the animal will not conform to our definition of soundness.

At the fetlock we will find dilatations of tendinous and articular bursae. Much will depend on their dimensions, and it is always policy to direct the attention of the purchaser to them. The region below the fetlock is fraught with many defects, and requires the closest scrutiny and judgment, for here we find that most serious lesion, ring-bone, the simple presence of which requires an unqualified condemnation. Here, too, we will find on the inside, marks of old or recent interfering, while just above the fetlock on both the inside and outside may be found the small cicatrices of neurotomy; or possibly the low operation may have placed the scars below the fetlock. Careful examination of the front foot is one of the most essential points in the examination, and it is best tested by the hoof-searching forceps for bruises or corns, or weak soles; while with the hand we will examine for side-bones, and having the foot raised from the ground we note if the plantar surface is flat or pumiced; if the heels are contracted; if toe or quarter-cracks be present; and our examination is not complete if we have not looked for thrush or canker. All of these diseases or conditions are likely to produce lameness, and our judgment must be formed according to our knowledge of their condition when we are making the examination.

Passing now to the rear in our detailed examination, we glance at the general position of the animal. From the hip to the thigh on each side, noting variations in the size of the two members; the shape of the hocks, and the obliquity of the fetlocks. Standing behind the animal, with one hand on each hip, looking first at the external angle of the ilium on one side, then the other; noting if they are on a level with each other; and at equal distances from the sacrum. Here, too, we may find atrophy of the gluteal muscles of one side, not an un-

soundness of itself, but possibly connected with former lameness. At the coxo-femoral joint evidences of counter-irritation having been applied to overcome positive or fancied disease of this region. Passing the hand down the femur, we reach the stifle, and failing to find anything abnormal, we proceed to that seat of dissension known as the hock. We will remember just here that a healthy hock consists of skin, bone and a few tendons; anything superfluous is abnormal. Around at the internal and anterior aspect of the region, we may discover a dilation of the synovial membrane of the tibio-tarsal articulation, constituting the ordinary blood or bog spavin; or the lesion may be of the tendinous sack of the tendo-Achilles, forming a thoroughpin. At the posterior surface we will look for exostoses and curbs. There is as little unanimity of opinion among veterinarians upon the soundness of horses possessing these defects as there exists among astronomers as to the distance of the furthest fixed star. It is, of course, unnecessary for me to speak of exostoses on the internal aspect of the hock joint, as I think the profession is a unit in condemning every animal possessing such an addition to his anatomy. Personally, I not only reject an animal when they are present, but will not tolerate the suspicion of such a condition. There is another thing to be carefully watched for, and that is the presence of stringhalt. Whatever the pathological lesion may be, it is an unsoundness, and it is sometimes so slight in its incipiency that we may overlook it. Therefore the first movements of the animal in backing out of the stall are of special importance to us, and a quick turn of the animal may produce the symptom where it is latent in the forward movements.

If chronic scratches of the front of the hock is not an unsoundness, it is a great nuisance, and it should be condemned along with chronic greasy heels. Below the hock we have about the same conditions as met with in the anterior extremity, only that interfering is better characterized. Puffy swellings may exist at the fetlocks, and the foot should be examined, especially to note if shod for interfering or over-reaching.

For this hurried and imperfect paper I must make some apology, but I am so sure that I have said a few things which are not in accord with the views of many present, that I feel you will be amply repaid by the expostulations and corrections of out-thinking minds.

REPORT ON INOCULATION AS A PREVENTIVE OF SWINE DISEASES.

By DR. D. E. SALMON.*

Inoculation with hog cholera virus was first tested as a preventive for this disease in the experiments of the Bureau of Animal Industry in the year 1886. The method of inoculation was discovered at that time, but the results were unsatisfactory, as the animals were not sufficiently protected, and the experiments have been repeated under various conditions from that time to the present to learn if any modification of the operation would make it more effectual.

Prevention by inoculation depends on the well-known principle that one attack of a contagious disease generally protects the individual from subsequent attacks of the same contagion. The amount of protection received varies greatly with different diseases and different animals. In no case are all individuals protected in this way from any disease, and in many cases the immunity lasts only for a short period of time.

Inoculation in practice consists in injecting under the skin as much of the strong virus of hog cholera as can be given without producing a fatal attack of the disease. Inoculation is very different from vaccination. The virus used in inoculation is the same in variety and strength as that found in animals dying with the plague, while for vaccination a weakened virus is used, which cannot cause a fatal disease. No method of vaccination has yet been introduced for the hog diseases of this country. Inoculation is now being advocated as a preventive for hog cholera, and it should be remembered that this means the introduction into the animal's

* Reprint from the advance sheets of the Annual Report, 1889.

body of the strong virus of the malady, and it is only a question of the size of the dose whether the disease produced by this operation is mild or fatal in its character.

The dose is not the only factor which influences the result that follows inoculation. The strength of the virus varies so much in different outbreaks of the same disease, that a perfectly harmless dose obtained from one outbreak would certainly be fatal when obtained from another.

There is another influence which has an even greater effect in varying the results of inoculation, and that is the wide difference in the susceptibility of the animals. A dose of virus that will scarcely affect one animal will kill another in the same herd, and there is also such a great difference in the susceptibility in different herds that the dose which might be used on one herd without producing any noticeable effects would set up a disease in another herd and cause the loss of a majority of the animals.

With these varying conditions, which in many cases can neither be foreseen nor controlled, inoculation is an operation which is attended with more or less danger of producing the very disease which we are seeking to avoid. In our experiments we found that a dose of 1 cubic centimeter, *i. e.*, from 15 to 20 drops, of the strongest cultivated virus would occasionally kill an animal. From one-quarter to one-half this quantity, *i. e.*, from 4 to 10 drops, have been given without serious consequences in any case.

Such doses generally produce a swelling where injected, which is at first warm and more or less painful, and later becomes encysted. The centre softens, disintegrates and becomes a purulent mass, which may remain encysted or may force an opening through the skin and discharge for several weeks. An inoculation of this kind produces a slight degree of immunity, because a second inoculation can then be made with two or three cubic centimeters of virus, *i. e.*, with four to twelve times the first dose, and still no fatal effects result.

The second inoculation increases the immunity, but still the animals are not able to resist the effects of feeding with strong virus or exposure in pens where sick animals are kept.

We inoculated about fifty animals in this way in our first experiments, varying the doses somewhat, and only five of them resisted the first exposure. By giving two inoculations we, of course, get a greater degree of protection than can possibly be obtained from one inoculation, with safety to the animals, but the expense of two inoculations is so great that, in order to make the method practical, the inoculator gives only one dose and generally increases that beyond the limit of safety. Thus, in some experiments that have been made in the West, I am informed that a dose of 1 cubic centimeter, *i. e.*, from 15 to 20 drops, was given, and many herds contracted the disease and died, as should have been anticipated from the experiments previously made by the Bureau of Animal Industry.

In view of these facts, when any one comes before the farmers of the country and recommends inoculation, it is well to inquire whether he is interested in the operation from a pecuniary point of view. The question as to how much the farmer will save by the adoption of this method of prevention is uncertain, and opens a wide field for discussion, but the sum it will be necessary for him to pay out to the experts who must be employed can be very accurately figured. This is one of the most practical aspects of the question and should under no circumstances be overlooked.

It has been asserted that as many as one hundred and four hogs have been inoculated in seventy-two minutes. At a cost of 50 cents a head, which is the amount now charged for inoculation, this would reach the sum of \$43.33 an hour for the services of the inoculator, which certainly appears to be more than those engaged in the hog-raising industry can afford to pay for professional assistance.

Should inoculation be generally adopted in the States in which hog raising is most largely carried on, it would require at least fifty men working five hours a day to comply with the demands. These men, inoculating eighty hogs an hour each, would inoculate a total of twenty thousand hogs a day, which would yield a daily revenue of \$10,000. The total cost of hiring fifty men and maintaining a laboratory to supply virus would hardly exceed \$300 a day. Putting the expenses at

the liberal sum of \$500 a day, the net profit to those conducting the inoculations would be \$9,500 a day. The inoculation of but a small portion of the hogs in the chief hog-raising States of the country would therefore yield a profit to the inoculator of about \$3,000,000 per annum, a sum which is sufficient to account for many of the enthusiastic and exaggerated statements of the benefits to be derived from inoculation which have appeared in public prints.

It has been shown by our experiments and by those of other investigators, that if a sufficient dose of virus is given to produce any degree of immunity the hog will be more or less stunted, and if the strong virus is used, there is great danger of infecting the ground. Now, these two faults are inherent in the method; they cannot be avoided, and it is impossible to so improve the operation as to overcome them. About a year ago an attempt was made to demonstrate the success of inoculation by inoculating one thousand hogs belonging to farmers in Nebraska. There had been quite a controversy between parties in that State for more than a year as to the merits of the operation, and undoubtedly every precaution known to the operators was practiced to secure a successful issue for this experiment.

The director of these experiments afterwards reported in the *Nebraska State Journal* of December 16, 1888, that one party who had 260 hogs inoculated had lost 220. Another farmer who had 46 inoculated lost "nearly all." Still another who had 121 inoculated lost "a large number," while a fourth who had 93 inoculated, lost "all but 18 or 20." It is evident from these statements that out of the 1,000 hogs inoculated, the loss was very little, if any, less than 400 head. The disease in these cases appeared in the inoculated herds from ten to fifteen days after the inoculation, and was evidently introduced in most if not in all cases by this operation.

These experiments show that inoculation is attended with very considerable danger to the health and lives of the animals operated upon. It is no doubt possible to so reduce the dose of the virus as to prevent this heavy mortality following the inoculation, but in that case the protection would be cor-

respondingly less. Leaving out of consideration the question of whether the hog, in case he survives the inoculation, is protected from the disease, it is plain that an operation which is followed by four hundred deaths out of a thousand inoculations has not been sufficiently perfected to merit the confidence of the farmers.

We will now turn for a moment to the question of the protection by the operation. To what extent were the hogs inoculated in Nebraska protected from the contagion, if really exposed to it? The advocates of inoculation tell us that it has been impossible for them to give the disease to their inoculated hogs. Our experiments at Washington show that nearly all inoculated hogs can be afterwards fatally infected with cholera. Did the animals inoculated in Nebraska receive any greater degree of immunity than those which were inoculated in Washington?

The Board of Inquiry appointed by the Commissioner of Agriculture in 1888, procured a number of hogs that had been inoculated in Nebraska (about seventeen), and tested them by feeding them with cultivated virus of hog cholera and by inoculating them with the virus of hog cholera and swine plague. In each case a number of the animals that had not received the protective inoculation were used in the experiments to determine the effect of exposure upon ordinary swine. The first test was made by feeding cultivated virus, but this did not prove strong enough to kill any of the hogs. Even those which had not been inoculated survived, but all of the hogs, including those that had been inoculated, were very sick. The inoculated hogs were not quite as sick as the others, but there was very little difference. Four of the inoculated hogs from Nebraska, and five hogs from Pennsylvania which had not previously been inoculated, were then inoculated with the virus of the disease known as infectious pneumonia or swine plague. Of the four Nebraska inoculated hogs, three died and one recovered, but this one when subsequently killed for examination proved to be very severely affected. Of the five hogs which had not been previously inoculated one died and four were sick and recovered. When

killed for examination one of the four was found seriously diseased, the three others were either slightly or not at all affected.

Still later four Nebraska inoculated hogs and two other hogs which had not been inoculated were fed upon the viscera of hogs which had died of hog cholera. Two of the inoculated hogs and the two that had not been inoculated contracted hog cholera and died. Two of the inoculated hogs remained well.

As a last test, the remaining six animals from Nebraska were inoculated by intravenous injection of the cultivated virus of hog cholera. Of these, three had been inoculated with hog cholera virus, and had been inoculated with the sterilized liquids in which hog cholera germs had grown, and two had recovered from an attack of hog cholera. The four hogs which had received the protective inoculation all died. One of the recovered hogs died and the other resisted the virus and remained well.

It is quite evident from these experiments that the animals inoculated in Nebraska were fully as susceptible to hog cholera after the operation as were those which had been inoculated in the experiments of this Bureau in Washington.

The conclusion that inoculation is not a satisfactory preventive for hog cholera is by no means inconsistent with the results obtained in investigating other diseases. Various experiments have shown that the protection which follows one attack of a disease or which is produced artificially by inoculation or vaccination is by no means absolute. It is simply an increased power to resist that particular contagion, and it may be sufficient to guard against the small doses of the virus which with most diseases are all that an animal is exposed to under ordinary conditions. But if from any cause a larger quantity of the contagion finds its way into the animal's body, it will contract the disease in a fatal form in spite of the immunity derived from a previous attack or from inoculation. This was strikingly shown in the writer's experiments with fowl cholera (Report Department of Agriculture, 1881-'82, p. 289) and by the researches of Professor Chauveau with an-

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thrax. While therefore it may be perfectly practical to prevent by inoculation those diseases in which the contagion does not multiply outside of the body, and with which the attack is caused by a small quantity of virus floating in the air or adherent to the wood-work of buildings, it may be much more difficult or impossible to prevent that other class of diseases to which hog cholera belongs, and which are caused by germs that multiply freely in water, in the soil, and in moist organic matter, and which are consequently taken into the body in enormous quantities, especially by swine.

There is another very important consideration which bears upon the practicability of preventing swine diseases by inoculation. Hogs inoculated with hog cholera virus do not receive the slightest degree of protection from any other disease. As there are at least two contagious diseases of hogs in this country, both of which are widely scattered and fatal, we cannot hope by any single inoculation to prevent all the losses caused by contagious diseases of swine. To inoculate for two diseases would double the expense, and this would be a very serious objection to such a method of prevention. The existence of two diseases has been very vigorously denied, but the conclusions of the Bureau of Animal Industry on this subject have now been confirmed not only by the Board of Inquiry appointed to consider this question, but also by Professor Welch, the eminent pathologist of Johns Hopkins University. In the future, therefore, the conclusions as to the economy of preventing swine diseases by inoculation must be based upon the assumption that there are at least two diseases, each of which will require a special inoculation for its prevention.

This brings us to the final test which must be applied to all methods of prevention, and that is their economic results. We will now consider inoculation from this point of view. Leaving out of consideration for the present the many reasons for believing that inoculation is a dangerous operation, and that it does not do what is claimed for it in the way of prevention, we will compare the cost of preventing hog cholera by this operation with the amount of the loss caused by this disease.

According to the estimates of the Statistical Division there are about 50,300,000 hogs in the United States. The inoculation of these at 50 cents per head would cost \$25,150,000. The total loss from disease during the year 1888 was 3,105,000 hogs at an average value of \$5.79 each. This would make the total loss of swine from all disease \$17,980,000. In order to estimate the loss from hog cholera we must deduct from this sum the losses from ordinary diseases, such as animal parasites, exposure, overcrowding, and improper feeding, which are always acting and do not produce epizootic diseases. These losses were estimated by the Statistician of the Department in 1886 to be about 4 per cent. of the total number of hogs, but as this may be considered rather a large estimate, we will in our calculation take 3 per cent. as the average loss from such causes. This would amount in 1888 to 1,509,000, valued at \$8,737,000, and deducting this from the total loss of swine, we have remaining \$9,243,000 as the losses from epizootic swine diseases. In the present condition of our knowledge we must admit that there are at least two entirely distinct epizootic diseases of hogs, which have been referred to in the reports of this Bureau as hog cholera and swine plague. The exact proportion of the loss caused by each of these diseases is at present unknown, but if we admit for the purposes of this calculation that but one-third of the loss is caused by swine plague, we have remaining a loss of but \$6,163,000 for the year 1888, which can be attributed to hog cholera. To prevent this disease by inoculation, as we have just seen, requires the expenditure in cash of \$25,150,000, or more than four times the value of the actual losses. In addition to this expenditure there should be counted the time required of the farmer in handling the hogs at the time of the operation and in giving them such precautionary care and in practicing such disinfection as is required to make this operation at all successful.

We should reach the same conclusion if, instead of estimating the loss and expense for the whole of the United States, we should take a single hog-raising State, as for example the State of Illinois. According to the Statistician's

estimates, there are 5,275,000 hogs in Illinois, and to protect these by inoculation would cost \$2,637,000. In the year 1888 the total loss of hogs in that State from all diseases was about 316,500, with an average value of \$7.45 each, which would make the loss for that year \$2,359,925. Deduct a loss of 3 per cent. of all the hogs in the State as caused by ordinary diseases, and we find that this would amount to 158,250 hogs, worth \$1,178,962. Deducting the losses caused by ordinary diseases from the total losses from all diseases and we have \$1,180,963 left to represent the loss from both hog cholera and swine plague. Take from this one-third to represent the loss from swine plague, and we have remaining as the loss from hog cholera about the sum of \$800,000. To prevent this loss by inoculation, as we have seen, would require \$2,637,000, or more than three times the sum to be saved.

While it is evident from these figures that inoculation can not be recommended for general adoption under the conditions in which the operation must now be performed, it is conceivable that there may be special cases in which it may be found advantageous, provided its protective power is fully demonstrated. At distillery establishments where large numbers of hogs are purchased for feeding, and where the losses are necessarily heavy from epizootic diseases, inoculation might prove an economic measure, but before deciding this question it would be necessary to have more definite data in regard to the average loss in these establishments.

Again, inoculation might prove efficacious in cases where considerable numbers of hogs are purchased at a distance by farmers for feeding. In this case there are unusual opportunities for infection during transportation, and experience shows that the loss from epizootic diseases is unusually heavy. Here also it would require considerable experience before it would be possible to say whether the operation would be a financial benefit.

The operation is also being tried by breeders of thoroughbred swine in some sections. In this case there are animals of much more than average value to be protected, and, at first sight, it would appear that an outlay of 50 cents per head

might be afforded in case any immunity could be assured. It should be remembered, however, that in case there should be considerable losses from inoculation, this would be more severely felt with high-priced animals than with those of average value. Another consideration even more important appears to have been overlooked. In inoculating a herd the contagion of the disease is introduced upon the premises, and in spite of any precautions which can be observed the grounds will be infected. This infection remains a considerable time, and the experience of those who have had herds inoculated is said to show that if any uninoculated hogs are added to the herd they are very liable to contract cholera and succumb to the disease. If this observation is correctly interpreted, it is apparent that hogs sold from such herds for breeding purposes are liable to convey the disease to the herds into which they are introduced. This being the case, no breeder could afford to have inoculation practiced on his herd, because none would buy from him knowing that there was danger of introducing a fatal disease with the animals purchased.

The considerations mentioned above, which our present information demonstrates to have a bearing upon the subject of inoculation, should be taken into account by swine breeders before the adoption of this operation. There are undoubtedly other arguments for and against inoculation which greater experience will bring out, but we can only form a reliable opinion of its availability by reasoning from the knowledge at hand, and this we have endeavored to set forth with as much detail as is practicable in a report of this character.

THE INSPECTION OF MEAT AND MILK WITH SPECIAL REFERENCE TO TUBERCULOSIS.*

BY MR. A. W. CLEMENT, V.S., OF BALTIMORE.

The subject of preventive medicine is one of such vast and growing importance to the public, that some action by the

*Read at a special meeting of the Maryland State Veterinary Medical Society, January 23, 1890.

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veterinary profession in Maryland, as represented by this the State Veterinary Society, seems advisable ; and as all that can be done, with the resources at our command, has perhaps been accomplished, the present is thought to be a fitting time for the presentation of a few facts. Whatever the public finds necessary for its comfort and well-being it is very apt to have, provided that it is convinced of the necessity, and provided that the cost is not out of proportion to the benefits to be derived. Our subject involves questions undoubtedly complicated, and those which should be thoroughly discussed. As members of the veterinary profession, it is our right and privilege to advise the public upon questions of public health which are, beyond doubt, connected with the consumption of meat and milk, and the association of man and animals.

That certain infectious diseases are common to both man and animals is well known to the practitioners both of human and of veterinary medicine. It is also known that the only possible chance of infection in certain diseases is through the consumption of meat which harbors the infecting principle ; and that in many other diseases the flesh and milk of animals used for food, while not the only source of infection, yet play an important part in the propagation thereof.

Now, if our opinion is to have any weight it must, above all, be candid. To alarm the public by an exaggeration of facts would not only be wrong, but would not further our purposes. To tell them that by the appointment of one or two veterinarians as inspectors of the meat supply they can have absolute, or anything like absolute, protection against the dangers of infection, would be but deception for the moment. To tell them, moreover, that the meat which they eat and the milk which they drink is in the majority of instances likely to convey infection, would be a gross exaggeration of the facts. Nevertheless, we who come in contact daily with the cattle slaughtered for the city market, know that much of the meat offered for sale is a quite possible source of disease, and one which can, to a greater or less extent, be avoided.

A disease which costs more lives by far than any other, is tuberculosis, or what is commonly called consumption. One

person in every seven born into the world dies of this disease, and probably one-third of the autopsies made upon persons dying from different diseases, including tuberculosis, will present lesions of this disease, either active or healed. It is a disease confined to no particular class of persons and bounded by no geographical limits. It is common to a greater number of species of animals than is any other disease known to medicine. In fact, it is quite probable that no species of animal living is absolutely immune or proof against its attack.

Certain conditions of life, such as domestication in the lower animals, and the crowding together, and lack of sanitary precautions in the human species, undoubtedly favor its development. How often, however, do we see those comfortably housed and surrounded by all that wealth can procure, fall victims to its attack. How often, in our own profession, do we see registered cows, so highly valued by their owners, surrounded by all the comforts possible, kept in stables where the sanitary arrangements are well-nigh perfect, or allowed in suitable weather, to graze upon the finest pastures—how often, I say, do we see such animals gradually lose in flesh and in the flow of milk, until they finally die, or become so valueless as to pass from the rich man's stable to the shed of one who is, to a great extent, dependent upon his cow to give him milk upon which to rear his family. In many other cases a cow with like history goes to form one of a number of similar animals constituting the dairy which supplies what purports to be pure milk to its customers. Then, too often, after she has been milked until, from the steady advance of the disease she ceases to produce enough to pay her keeping, the glue factory is cheated, at the expense of the citizens who buy her in small pieces at the stalls in our market places. Of course this is not first class meat, but it forms a very considerable proportion of the meat from which sausages are made.

We know, moreover, that tuberculosis does not always produce such extreme emaciation in cattle as in the cases above cited. How often do we see cattle slaughtered, the lungs and glands of which are filled with "boils," to use the expression common among the butchers, but whose flesh is

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quite up to the standard, so far as appearances are concerned, at any rate. Yet is not the flesh as apt to contain the virus in the one case as in the other? I am well aware that the flesh may not contain the virus to any appreciable extent in either case, and that, moreover, if it does, the process of cooking and the healthy condition of the digestive apparatus in the consumer may render it inert; yet it has not been proven that infection may not take place by consumption of such meat, and many of our best authorities are of the opinion that it can and does. The exact behavior of the tubercle bacilli under the conditions ordinarily present in the process of cooking has not yet been determined. To raise, in this process, the meat to a temperature necessary to make sure that all the organisms are killed, would involve a hardship, to say the least, to those of us who like our beef rare and juicy. I imagine that most of us, if we had our choice, would prefer to take our chances of infection that we might have our beef a little underdone.

It is not my purpose here to discuss the etiology of tuberculosis, but to assume beyond all doubt that it is due to a micro-organism known as the tubercle bacillus, first described by Koch in 1882. His work was so complete that no one has as yet been able to add to it anything of importance. It was a discovery which has taken such a hold upon the minds of the medical profession, that he who disbelieves it to-day is one who will not change his opinion, or one who is unacquainted with the present methods of investigating infectious diseases. I will not detain you with a description of the organism, further than to say that it is a bacillus, or rod-shaped object, about one-third as long as the diameter of a red blood corpuscle, and about one-tenth as broad as it is long. It has the property of resisting the action of acids in specimens stained with aniline colors, which serves to distinguish it from other organisms. It grows slowly and only in certain media, preferably blood serum and glycerine agar. These organisms are found in all the tissues in which the lesions are present and in the fluid from the affected parts. The organism is the same, no matter what species of animal it may affect.

If a piece of tissue from man, containing the organism, be inoculated into an animal, the chances of infection are in proportion to the susceptibility of the animal inoculated. If the same lesions are to be found in man and animals, if the progress of the disease is the same in both individuals, and if the same organism is found in each, can any one doubt the identity of the disease in man and animals?

As I said in the beginning of this paper, the disease is the greatest scourge with which we have to deal. None of the so-called highly infectious diseases, such as cholera, yellow fever, small pox, can compare in mortality with it.

In Paris in the year 1884, a year taken at random, out of 56,790 deaths, about 15,000 persons died from tuberculosis, that is, a little over one-fourth of the deaths were from this disease. In Baltimore, for the year 1888-1889, the total deaths were 8,703, of which number 1,147 were due to tuberculosis. In New York City, for the year 1888-1889, there were 5,913 deaths from this disease. These data give only the mortality from tuberculosis, and doubtless chiefly pulmonary tuberculosis. There is reason to believe that many deaths from tuberculosis affecting the joints, bones, lymph-glands, serous membranes and still other parts than the lungs do not appear in proper proportion in these reports of death rates. Moreover, a large number affected with tuberculosis recover.

The percentage of deaths in animals from this disease it is of course impossible at present to obtain. There are, however, some statistics with regard to the proportion of animals affected with tuberculosis as found at abattoirs and slaughter-houses, and, though of course less reliable, from ante-mortem diagnoses. In the report of the proceedings of the last International Veterinary Congress, the following statistics are given: From the abattoir at Brussels for 1889, the percentage of tuberculous animals is given as follows; 1.2 per thousand for steers; 1.9 per thousand for bulls; 19.9 per thousand for cows, 0.1 per thousand for calves. In Amsterdam, out of 13,207 cattle, 268 were tuberculous—2 per cent. Out of 15,827 hogs, 63 were tuberculous, 0.4 per cent. At Utrecht,

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where no abattoir exists, the percentage of cases observed is placed at 0.24 per cent. (8 out of 3,250 cattle). In Saxony, according to Siedamgrotzky, the general proportion would be 2 per cent., but in certain cities where the inspection and the abattoir are imposed, the percentage is much higher—16.6 per cent. at Frankenburg, 17 per cent. at Penig, 19.9 at Dobeln, 22.4 per cent. at Zittau. Tuberculosis is frequently observed in calves. In the Argentine Republic, the proportion of tuberculous cattle is reported as from 10 to 15 per cent. for those imported into the country, as against 0.5 per cent. for natives. According to Liautard, the proportion of tuberculous cattle in the United States is from 25 to 30 per cent. In Copenhagen, for the past year, the general statistics give a proportion of 6 per cent.; it is much higher for cows, being 16 per cent. At the abattoir of Montauban, the proportion is given as 6 for one thousand. In Russia, the disease, unknown among the animals indigenous to the south, is very frequent in the north, especially among those imported and those kept in stables; it sometimes runs as high as 50 per cent. In the abattoir at Bucharest, the proportion is sometimes as high as 30 in 100.

At the Berlin abattoir, which probably furnishes the most trustworthy statistics in existence, the official report* for the year 1887-'88 show that a total of 924,815 animals were killed. "The entire carcass was condemned as unfit for human food in 5,783 cases, the cause of seizure being shown in the following table :

Disease.	Number of Animals.
General tuberculosis	2,435
Caseous pneumonia	14
Peritonitis	6
Dropsy	298
Scrofula	1
Ruptured stomach	5
Jaundice	84
Loathsome character of the flesh	131
Bloody	36

*Adam's Wochenschrift, No. 6, February, 1889.

Disease.	Number of Animals.
Rothlauf	399
Trichinosis	311
Tapeworm hydatids	1,926
Echinococci	1
Actinomycosis	69
Calcareous concretions	67

Besides these cases of total seizure, single organs and parts were condemned from 23,297 cattle, 9 calves, 9,051 sheep, 19,459 pigs. There were also withdrawn from consumption 2,727 unborn but nearly developed calves, 7,993 calves in less advanced stage of development, and 157 animals that had died. Tuberculosis was detected in 4,300 cattle, 8 calves and 6,393 pigs, and on account of that disease the entire carcasses of 985 cattle, 8 calves and 1,442 pigs were condemned, while 8,322 organs or parts were withheld from consumption. The actinomyces in the muscles led to the seizure of 69 pigs, and 67 in addition were condemned for calcareous concretions. In the cases of partial seizure, the following parts and organs were condemned: for the presence of echinococcus, the lungs of 5,128 cattle, 3 calves, 3,348 sheep and 3,681 pigs; and the livers of 1,887 cattle, 2,436 sheep and 4,715 pigs. The presence of the liver fluke led to the condemnation of the livers of 2,108 cattle, 2 calves, 2,212 sheep and 137 pigs. The presence of thread worms led to the withdrawal of the lungs of 788 sheep and 3,237 pigs. No fewer than 249 persons are engaged in connection with the meat inspection in the city of Berlin.

In the quarantine limits around Baltimore, that is, for a distance of six miles from the City Hall, an accurate account is kept of the cows slaughtered. Dr. G. C. Faville, at the head of the United States Government Inspection Service in Maryland, furnishes me with the following statistics: From November 1st, 1888, to November 1st, 1889, post-mortems were made on 5,297 cows, showing 159 cases of tuberculosis, which is a little over 3 per cent. The above data refer chiefly to pulmonary tuberculosis. In those cows dying within

the quarantine limits around Baltimore, upon which a careful autopsy can be held, tuberculosis is sometimes seen confined to organs other than the lungs, so that the percentage should really be higher.

The percentage of tuberculous cattle in which the tubercle bacillus has been demonstrated in the milk, is, according to Bollinger, as follows:

In a lot of cows affected with extensive tuberculosis, 80 per cent. showed infection of the milk. In a lot with moderate tuberculosis, 66 per cent. showed infection of the milk. In a lot with slight tuberculosis, 33 per cent. showed infection of the milk. Drs. Ernst and Peters, in some valuable experiments made at the experimental farm near Boston, fed 13 calves and 7 pigs, healthy at the beginning of the experiment, on the milk of 18 tuberculous cows, taken from ten different herds, representing eight towns, all within a radius of twenty-five miles from Boston, except in one instance where a cow came from Newport, R. I. The feeding was continued for a period of from three to six months. At the end of this time they were killed and the post-mortem examination showed that six of the calves and two of the pigs were tuberculous. Nine of the eighteen cows were killed, and the diagnosis verified by post-mortem examination. Tubercl bacilli were found in the milk of six of these cows. These experimenters have proven that the milk of tuberculous cows may convey infection when the udder is free from any tuberculous disease. Dr. Peters informs me by letter that he has visited several herds in the State of Massachusetts, and found the disease in from 1 to 100 per cent. of the animals. The same gentleman has published a report of a case which came under his observation, where a pet dog became affected from eating the sputum of its tuberculous mistress.

Prof. Peuch publishes an interesting note* on the contagion of tuberculosis. His experiments are as follows:

"I. By the unboiled milk. (1). A pig two months old was fed for a period of five days with the milk of a cow affected

**Revue Veterinaire*, December, 1888.

with extensive tuberculosis. The autopsy on this cow established the existence of tuberculous lesions in the mammae. At the end of 56 days the pig was killed, when it presented no lesions referable to tuberculosis. (2). Four rabbits received by injections into the abdominal cavity the milk from a cow extensively tuberculous, in doses of ten, twenty and thirty grammes, during a period of five days. All these rabbits became tuberculous. The extension and the multiplication of the lesions was directly proportional to the quantity of milk inoculated.

“ II. Contagion by the uncooked meat. (1). Two pigs, two months and a half old, were fed during a period of ten days, each five and a half kilograms of uncooked meat, taken from the cow above cited. This meat was entirely consumed. One of the pigs, killed at the end of seventy days, presented some tuberculous granulations in a ganglion under the tongue and in a mesenteric ganglion, as well as in the liver. The other showed granulations in the mesenteric ganglia. (2). Three rabbits received a hypodermic injection, each two-tenths of a cubic centimeter of juice taken from the meat of the same animal from which the pigs were fed. These three rabbits presented, at the autopsy, some very pronounced tuberculous lesions.

“ III. Contagion by the juice of the flesh of a capon dead from tuberculosis. The muscle of this capon being pressed furnishes a red juice which is inoculated into three rabbits in doses of one, two and three cubic centimeters. Killed at the end of sixty, eighty-three and one hundred and twenty days. All of these rabbits presented, at the autopsy, numerous lesions of tuberculosis.

“ These experiments tend to prove:

“ 1. That the milk coming from tuberculous cows is virulent.

“ 2. That the juice from tuberculous meat is also virulent.

“ 3. That the virulence of these products is less pronounced by gastric ingestion than by subcutaneous inoculation.

"4. That the effects of this virulence are correlative to the quantity of matter inoculated."

In a review published in the *Revue de Medecine Veterinaire*, July 15, 1889, the following summary of recent views appears:

"Before becoming a general malady, tuberculosis is a local disease limited to the entrance which corresponds to the territory of invasion and of the primary development of the specific bacilli.

"A primary generalization from the beginning can only be produced experimentally by the introduction of the bacilli into the circulatory system. Practically the generalization of the malady is always secondary, since, according to Weigert, it is only observed in those individuals affected by the disease where a soft focus has opened into a blood vessel or thoracic duct.

"From a hygienic point of view, it does not concern us to know whether the tuberculosis is local or general, but whether the meat of animals affected with tuberculosis may or may not be admitted for consumption. This question has been treated and discussed at the Congress for the study of tuberculosis in 1888. The great majority of the members of this Congress were in favor of the rejection of this meat for human consumption in all cases of tuberculosis.

"At the same time, Bollinger has never been able to transmit tuberculosis by injection into the peritoneum, of the juice of the muscle-flesh taken from twelve tuberculous cows.

"M. Nocard, experimenting with the juice of the flesh of twenty-one cows affected with extensive tuberculosis, was able to transmit the disease to a guinea pig in only one case.

"M.M. Toussaint, Chauveau, Arloing, H. Martin, Vallin, Peuch and Galtier, on the other hand, have reported several experiments where the muscle-juice has shown itself to be highly virulent.

"MM. Gratia and Lienaux bring forward, in their turn, a series of experiments to clear up this question of the virulence of tuberculous meat. In their hands, the muscle-juice from a man attacked with general tuberculosis showed itself virulent in both cases in two inoculations practiced on guinea

pigs, while that from the juice of a tuberculous cow, gave them, under similar circumstances, a negative result.

"The experiments of MM. Lienaux and Gratia have been neither numerous enough nor varied enough to permit these authors to draw conclusions, and they themselves propose to extend them.

"In the present stage of the question, it is demonstrated that the juice of tuberculous meat may be sometimes virulent, if it is not always so. Now, from a hygienic point of view, there is danger in allowing the consumption of this meat, whether it has been proven to be virulent or not. Inasmuch as it is not possible to separate definitely those which are from those which are not virulent, one will do well to consider all as dangerous, and for this reason to reject them for human consumption. The public will not be compromised for that, and there will be fewer cases of tuberculosis. In our opinion, the tuberculosis Congress has deliberated wisely in expressing the opinion that the meat of tuberculous animals should be rejected for human food*."

Since this publication it has been proven under Bolinger's direction that the muscular tissue from human beings affected with pulmonary tuberculosis, may convey tuberculous infection to inoculated animals.

We might go on citing experiments, but I think that enough has been presented to show that there is danger from the consumption of meat, and that there is more danger, especially to the young, from the consumption of milk from tuberculous animals. I wish now to call your attention to some conclusions which have been reached by the International Veterinary Congress and the United States Veterinary Medical Association, also to offer a few suggestions of my own with regard to the better control of the milk supply, and perhaps the meat supply, of Baltimore, and to put in a claim on the part of the veterinary profession for representation at no distant time on the City and State Boards of Health.

**Annales de Belgique*, Decembre, 1888.

To be continued.

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."—VETERINARY RECORD.

JABOT—CONSTRICKTION OF THE CESOPHAGUS.

By J. P. KLENCH, V.S.

In the February number of THE AMERICAN VETERINARY REVIEW, Dr. R. R. Morrison published a very interesting article on the obstruction of the oesophagus. As a proper addenda to that article, I will report two similar cases of my personal observation for the purpose of bringing more light on the subject.

Several years ago I attended a two-year-old colt that was fed on straw, choking and unable to swallow for three or four days. I found the oesophagus dilated from the pharynx down its course for ten or twelve inches. The colt was every few seconds suffering from convulsive coughing, shaking its head violently as if suffering from strangulation. At the lower end of that pouch I could clearly notice the oesophagus to be firmly contracted; mouth and nostrils were soiled with masticated straw and saliva. While the colt held the head low, I passed the contents of that pocket gently with both hands towards the pharynx, and the animal would eject them through mouth and nostrils. Thus I succeeded in emptying several times that artificial jabot and caused the colt to swallow water and a little bran mash, which fact convinced me that there was no total obstruction of the oesophagion canal. But after an interval of a few minutes, the pocket would fill again up to the pharynx and the same paroxysms of convulsive coughing and strangling returned. That colt died.

On October 26th last, I was called at three o'clock A.M. to visit a colt, two years old, belonging to Messrs. Alexander Bros. near Santa Rosa, California.

History.—Three weeks before my visit they noticed this colt having, while running in an alfalfa pasture, a big lump on the neck, near the breast. This lump went away, came back, and disappeared again, without ever having, to their knowledge, caused the colt any visible trouble. They took the colt

up five days before my visit, to break him to harness, and fed him on hay and grain. He ate well and showed no sign of a lump on the neck. On October 26th, at night, while the colt was near through eating his ration of hay and corn, the proprietors noticed the animal to have violent cramps of the neck, causing great agony and distress.

Symptoms.—I found the colt standing away from the manger, saliva dripping from the mouth and nostrils. On the lower portion in front and somewhat to the left side of the neck, I noticed a tumor, firm and solid on pressure, covered by the sterno-maxillary and Lyoidien muscles, so that it was very difficult to give the real size of the tumor. However the enlargement took in the third lower portion of the neck. On pressing this tumor the colt contracts spasmodically all the cervical muscles, stretching out the head or the neck which is partially lowered, while at the same time the animal is squealing loud from pain, coughing and ejecting, through the mouth and nostrils, large masses of saliva and mucous. Between the spasms the colt swallows saliva, gulping the same with difficulty, and gradually filling up the oesophagus from the tumor to the pharynx, when another spasm comes on. The physiognomy of the colt, during the spasms, is similar to the expression of animals during the act of vomiting or nausea.

Diagnosis.—Constriction of the oesophagus and artificial jabot filled with feed.

Prognosis.—Very serious, perhaps fatal.

Treatment.—Friction every half hour on the neck along the course of the oesophagus, with the following liniment: laudanum and fluid extract of belladonna ea. 3*i*; gr. arnica, ether and camphor spirit, ea. 3*ii*; a hypodermic injection of $\frac{1}{4}$ grain of morphine was made on the left side of neck. Half an hour after the second friction the colt seemed to be easier and the spasms did not return so frequently. The frictions were continued all the night. In the morning, six o'clock, the tumor was softer, but still containing feed, the muscles relaxed over the tumor; the animal felt at ease, drank water very carefully; there are no cramps on pressing the tumor, even when roughly manipulated. I then injected up in the mouth a mixture of ginger tr. 3*ss*; tr. gentian,

3 i; ether, 3 i; water, 3 ii. Half of that quantity was given and the animal began to have very violent spasms of the neck, ejecting, through mouth and nostrils, finely masticated feed and saliva. Those cramps lasted several minutes, when the colt suddenly appeared to be very easy, resting the head on the manger in a sleeping manner. Noticing that, I approached to examine the tumor, but, to my surprise, it had entirely disappeared. Those injections were repeated during the day three times at the interval of three hours and no more tumor reformed, nor did any more spasms reappear. The jabot still exists, but without its contents. The colt eats hay, drinks water and swallows without difficulty. I gave before leaving order to turn the colt out again on the grass, to give no grain nor corn, nor put him to work for three months. On November 12th I revisited the patient and found still the existence of a small, soft tumor, that can be easily reduced and pressed without pain. I had him taken to the barn, fed on corn and hay in my presence. He swallowed large balls of masticated food regularly without trouble. I saw these food-balls pass down the oesophagus in the jabot, come out distinctly under the muscles, leave the jabot and continue their passage to the stomach without causing the least spasmodic pain. The proprietor remarked to me that a few days after my first visit the colt had several spasms again and that the lump reappeared again large and full; but that by injecting the above mixture, he relieved the animal immediately of all distressing symptoms.

Remarks.—Of the three cases now on record, the direct cause of the complaint can be traced in one to dry food straw) that was not sufficiently salivated; in the second one,) to green alfalfa, that was probably too voraciously swallowed; in the third case, reported by Dr. R. R. Morrison, to a supposed carrot (although masticated food was found in the jabot). From the similarity of the symptoms in these three cases, I can reasonably conclude to the existence of the same nature of disease, so that in all certainty, there was no total obstruction in any of them. In all three cases an intense irritation of the ganglionar and pneumo-gastric nerves was manifestly expressed by the lightest pressure on skin or mus-

cles of the cervical region and by convulsive coughing.

I have seen, many years ago, a total obstruction of the œsophagus caused on a horse by a large medicated pill, for four days without producing any spasms of the neck, although there was profuse salivation, great general debility and tympanization of the abdomen. I have observed similar symptoms, without spasms, on several cows that were fed on corn cobs. Would not the difference in the symptoms lead one to suppose that in some cases the disease was directly caused by a foreign body, while in many other cases by a nervous constriction of the œsophagus previous or posterior to the dilatation of the same. For the successful result of my treatment in the Santa Rosa case proves evidently that the disease was not cured after jabot was emptied, and that the constriction as well as the jabot still existed in part as in toto. This effect of the sedative treatment demonstrates that by calming the nervous irritation it modified or alleviates the disease, and produced a temporary cure. The filling of the jabot would then be a consecutive effect. The existence of the jabot does not constitute the disease; it is only a pathological defect or abnormality. Whether this opinion is correct or false, the fact remains established that in a good many cases the diseases can be alleviated and perhaps cured by therapeutic means without performing the œsophagotomy. Unless the obstruction be directly caused by a foreign body I would advise to try at first morphine and the sedative liniment and empty the jabot by administering the above stimulating and irritating mixture, then remove the constriction by repeatedly drenching the animal with a few ounces of belladonna and hyoscyum oil and external application of the sedative liniment.

As for the final result of this jabot, I cannot say whether or how they disappear, as I have lost my Santa Rosa case out of sight. But I think that whenever there is no laceration of the œsophageal muscular fibres, the dilated portion will gradually retract in young horses, if they are carefully fed for several months with small rations of dilute or fluid feed, cut hay, fed moistened, or green grass. In case of laceration, the operation is indicated.

TWINS IN A MARE.**By JULIAN C. FAGAN, D.V.S.**

This morning a case came under my charge that may be of some interest to you on account of its rarity.

In August last a bay road mare about thirteen years old, was served by the thoroughbred stallion "Blast," and my services were solicited from time to time to examine the mare's condition. Everything progressed nicely until early this morning, when the owner noticed the mare very uneasy and sent for me.

On my arrival was surprised to find the mare had aborted twin foetuses (male and female); the combined weight of which was about fifty (50) pounds. Each foetus had its separate membrane.

The cause of the trouble could not be settled. The mare's surroundings were as nearly perfect as could be. She was fed well and had nothing to annoy her, as she had a stable to herself.

WAS IT GLANDERS? IF SO, IS IT CURED?**By R. A. STOULE, D.V.S., Barbados, West Indies.**

As this case is peculiar, as well as interesting, I would like the opinion of some other veterinary surgeons on it. To render my paper explicit, I must refer to some extent to an outbreak of glanders which occurred in the same stable as my patient.

Some time ago, on September 18, 1889, eleven horses were landed here from New York, U.S. The morning following two of them were sold at an early hour. A few hours later I was called in to see two of the horses, which were supposed to be suffering from severe colds. On examining them I found both acutely glandered. I requested that they should be immediately destroyed. I examined all the others, but except slight elevation of temperature and a few peculiar looking lumps on off gluteal region in one horse I found nothing abnormal.

September 23d I was again called and found the one with the lumps on the hip with small abscesses in the place the lumps had been and the lymphatics corded and leading down

to the inner surface of thigh, in fact presenting well marked farcy; also found two others presenting similar symptoms I also had those destroyed. On September 24th I was called to see one of those which had been disposed of. I found that glandered. Some six weeks later the other one which had been sold was destroyed by another veterinary surgeon. During the interval three horses had been sent to another island. You will find that that leaves one out of the eleven received; this one was kept alongside of the horse that I will call my patient.

On October 31st was called in to see these two horses. The first one, or the last of the eleven, I found a well marked case of glanders; the other presenting the following symptoms: respiration slightly hurried; temperature 102° ; right submaxillary gland enlarged, hard and not very painful; slight discharge from right nostril, which was rather gluey; mucous membrane of the nostrils bluish.

Having seen subcutaneous injections of olii. tert. recommended as an aid in the diagnosis of glanders and having tried the same with marked success in a number of cases, I decided to do so in this instance also. Mr. W. H. Thorpe, who is with me, proposed that we should use it in a large dose and see what effect that would have. We injected in the side of the neck 43 with the following result:

Two days later had temperature of 105° , the other submaxillary gland also enlarged, profuse discharge from both nostrils of a substance similar to albumen, but not quite as thick, spot surrounding injection enormously enlarged, parotid gland on same side also large. These conditions remained for a few days, when both submaxillary gland as well as parotid suppurred; I also opened the side of the neck. All of these I treated as simple abscesses. When they were healed the horse seemed in perfect health and has continued so up to date, March 11, 1890.

I am watching this case with great interest and shall report if any change occurs. I would also like some one else to try this in a well marked case of acute glanders and report result, as I intend doing so.

EXTRACTS FROM FOREIGN JOURNALS.

SUPPLEMENTARY LOBES OF THE LIVER LODGED IN THE THORAX.

By MR. GUINARD.

Two cases of this kind were observed by the author, in bovines, the most interesting of which is the following: This steer had on the anterior face of the liver a true hepatic intra-thoracic lobule, resting on the anterior face of the diaphragm, and surrounded by the lungs. It was held by a short peduncle, running through the diaphragm in the centre of the phrenic centre, and which established a proper communication between the accessory lobe and the organ itself. This peduncle was run through by biliary ducts and blood vessels. In structure, the supplementary lobe was exactly like liver tissue, and seemed to possess all the physiological properties of that organ. The opening of the diaphragm through which it hung in the chest was entirely closed, so that no communication existed between the two splanchnic sacs. In the second case the lobules were smaller, spherical and resembled small hepatic hernia, protruding on the anterior face of the diaphragm.—*Journal of Zootomie.*

NOTES ON CASTRATION STANDING UP.

By Mr. CADEAC.

The following observations were made by the author to test the value of this modus operandi and the possibility of complications. Five animals were operated upon in the mode generally followed by gelders or veterinarians who employ this process. One was castrated by the covered operation without complications; another by the uncovered operation, also without complications; a third had a champignon on the right side; the fourth also had an enormous champignon; the fifth had also the same complication on the left side. From these cases the author seems inclined to object to this mode of operation, and to prefer the safer mode of casting. It is proper to remark that in these five cases the castration was made with the clamps, instead of the torsion, as is done by the American operators.—*Journal of Zootechnie.*

ENZOOTIC ABORTION IN COWS.

BY DR. G. SCHNEIDEMUHL.

While adopting the microbian theory of contagion in cases of abortion, the author considers it a serious error to admit the presence of a specific infectious agent in a cow shed as sufficient in all cases to give rise to abortion, and think that contributing causes, such as are liable to debilitate the animal and impair her power of resistance to the contagious influence, should also be taken into account. For this reason he advises a proper attention to preventive measures, such as a better regulated hygiene, a liberal and nutritive diet, and the interdiction of reproduction between members of the same family, or by bulls which have been kept on premises where cases of abortion have taken place, as well as with cows that have aborted.

When cases of abortion have taken place in barns, he recommends the frequent washing of the vulva, of the vagina and around the anus of the patient, together with the disinfection of the barn with a solution of phenic acid, with per cent. chloride of mercury, or of creoline, one to one thousand.

He also recommends the treatment of Nocard and of Brauer, and in general advises the following measures: the complete disinfection of places where cows have aborted; the subcutaneous injections of Brauer, at the flank of pregnant cows every two weeks, with from five to ten grammes of a two per cent. phenic solution; the exclusion, for breeding purposes, of cows that have aborted, or which have retained the foetal envelops too long, or such as may have contracted uterine disease; the removal of the manure; cleanliness of the gutters of the barns; the removal of the cows from the premises until the disinfection is perfectly accomplished; and the isolation of cows which are near calving time.—*Thiermed. Vort.*

SEPTICÆMIA IN A STEER.

BY FEUTZLING.

An eighteen months old steer was killed because of alarm-

ing symptoms of disease, and principally of an abundant diarrhoea.

The following lesions were found at the post-mortem : meat soft and without consistency, with an extremely disagreeable putrid smell, and infiltrated with serosity ; intestines and stomach normal ; spleen hypertrophied, of dark color and soft ; liver pale and oedematous ; lungs emphysematous. The condition of gaseous infiltration in the meat and the viscera showed itself a few hours after the slaughtering. A bacteriological examination of the spleen and of the blood disclosed large quantities of small mobile rods twice their width in length, and one-half the size of the bacillus of anthrax.

They were easily colored by the aniline preparation. Animals inoculated with the blood or the splenic pulp died in from twenty to thirty-six hours, and showed the same bacilli, principally in the blood. Cultivated on gelatine or potatoes, they form colonies of a grayish color, which do not liquefy gelatine, and which killed rabbits, mice and guinea pigs.

Shottelius classifies these bacilli among the septic microbes.
—*Thierarzth. Milth.*

RENAL CALCULI IN A COW.

By LOSON.

The author found in the left kidney of a cow ; 1st, several hundreds of calculi varying in size from that of a small pea to that of a large nut, and weighing altogether four hundred and eighty-eight grammes, and 2d, a calcareous magma weighing seven hundred and eighty-eight grammes. These calculi were composed of carbonate of lime, phosphate of lime and magnesia. No uric or oxalic acid or cystine or cholesterine were present.—*Thierazth Milth.*

TREATMENT OF SCABIES IN SHEEP BY CREOLINE.

By HÖHENLEITNER.

From experiments made with a three per cent. solution of creoline, the following conclusions were formed :

1st. Baths are very efficacious when sheep have been sheared, and also after a thorough washing of the wool.

2d. A bath of one to one and a half minutes, followed by a scrubbing of three minutes, is sufficient. The wool on the skin must be well rubbed with the hands.

3d. Two baths, seven days apart, are sufficient.

4th. Solutions of creoline is perfectly harmless.

5th. After the bath, the wool takes a brown coloration, which soon disappears.

6th. The cost of the operation is trifling.—*Wochens. f. Thierh.*

ABSCESS OF THE SKIN AFTER TREATMENT WITH BROMIDE OF POTASSA.

BY SARD.

In treating a case of traumatic lockjaw, the author used bromide of potassa for three days, in large doses, exceeding two ounces a day, which was followed on the fifth day by a vesicular eruption on the skin. The vesicles ulcerated, and at the same time the four legs became largely swollen. After these manifestations the trismus and the symptoms of tetanus subsided and the animal recovered, although the trouble of the skin required a long time to heal.—*Reperf. d. Thierh.*

CARCINOMA OF THE BLADDER.

BY PROFESSOR FRIEDBERGER.

A mare twenty years old, without any apparent cause or external symptoms, passed reddish urine, containing clots of blood. On passing the finger in the urethra, a thickening of the mucous membrane was observed, and rectal examination revealed the pressure on the head of the bladder of a tumor about the size of a pigeon's egg. A diagnosis was made of hemorrhagic cystitis, due to the presence of a tumor. The animal died and the post mortem confirmed the diagnosis, the bladder containing several nodosities of various sizes, resembling the cerebral substance in structure. The lumbar ganglia were softened and hypertrophied, the heart was fatty, and the lungs ædematous.—*Wochenschr. f. Thierh.*

INTRA-TRACHEAL INJECTIONS IN BRONCHITIS VERMINALIS.

By KRIWONOGOW.

In an outbreak of this disease, where several forms of treatment had failed, intra-tracheal injections of eight grammes of the following solution relieved the calves that were yet diseased: Essence of clover and spirits of turpentine, of each 360 grammes, with thirty grammes each of phenic acid and olive oil. Two injections were sufficient to bring on improvement; after the fourth dead filaria were expectorated.—*Œsterr. Monat. f. Thierh.*

**SEVERE ROARING DUE TO A LARGE SUB-PAROTID ABSCESS—
TRACHEOTOMY—DEATH BY SEPTICÆMIA FIVE DAYS AFTER
THE OPERATION.**

By M. BEYLLOT.

Like many others in that location, this abscess had resisted the progress of maturation, and notwithstanding blistering and poulticing, the animal was threatened with suffocation. When the author was called to see the patient, she presented all the symptoms of the most violent dyspnœa, due to the presence in the left parotid region of an enormous abscess, in which the suppuration was still too deep to be detected. Seen first at night, and the exploration of so vascular a region being dangerous, a tracheotomy tube was improvised, the operation performed, and followed by immediate relief to the patient. The next day a better instrument was procured and put in place, and the animal being in much better condition, was allowed all the nourishment she was willing to take. On the second day fluctuation was detected and the abscess was opened with the actual cautery, a yellowish, thick, creamy pus escaping. The wound of the tracheotomy had a foetid odor and there was a slight swelling of the left hind leg and careful antiseptic washing was recommended. Forty-eight hours after, the animal was relieved of the tube, the abscess discharging freely the wound of the neck being still very offensive. The appetite was fair. The left side of the upper lip was the seat of a small swelling. During the evening the animal was

taken with colic and delirium, biting her bedding, and becoming dangerous to those who approached her. A semi-paralytic access followed, the left hind leg seeming powerless to support her, and soon after the pulse became imperceptible and extremities cold. The upper lip was largely swollen. Her miseries were ended by pithing. At the post mortem all the sphincters were found to be relaxed. The urine escaped by the vulva, and there was a diffused swelling of the body, and especially of the left hind leg. The subcutaneous tissues were infiltrated with yellow gelatinous serosities and a blackish ecchymosis. There were clotted deposits, through the muscles, so large in some that they were of a black coloration. The septum nasi were dark red, the lymphatic glands swollen. The blood of the jugular was dark and very liquid. The cartilaginous respiratory tract was congested. The wound of tracheotomy was gangrenous. The lungs on their surface were covered with black, round spots of various sizes, but there was no hepatization. Incisions through its substance caused the escape of dark incoagulable blood. The costal pleura contained petechiæ here and there. The pericardium contained abundant citrine liquid. The heart was pale, the ventricles containing large clots of yellow saffron color gelatinous in aspect and extending into the auricular. The spleen, liver and kidneys were anæmic, the small intestines congested and the cœcum and colon bloodless.—*Revue Veter.*

PASTEUR INSTITUTE OPENING IN NEW YORK.

The opening of the Pasteur Institute in this city, for the preventive treatment of hydrophobia and the study of contagious diseases, took place on the 18th of February last. The institute was founded by Dr. Paul Gibier, of the Faculty of Paris, student and friend of Pasteur, and ex-adjunct to the Chair of Comparative Pathology at the Museum of Paris. The laboratories are kept at 178 West Tenth Street. A good delegation, comprising several prominent members of the French colony of New York, together wit^h a fair representa-

tion of our American society, were present, and the metropolitan press as well as that of other cities took notes of the occasion.

The French Consul General, Viscount Paul d'Abzac, presented Dr. Gibier to the audience, and improved the occasion to enlighten them as to the scientific attainments of the doctor and of the various scientific missions with which he had been connected. "Ex-interne at the hospitals of Paris, his was the sad duty of making the autopsy of Gambetta; and he was on six different occasions appointed upon medical and other scientific commissions by the French Government." Dr. Gibier then introduced his collaborators: Prof. A. Liautard, as Consulting Veterinarian, and Dr. G. Van Schaick, one of the professors of the Post Graduate Medical School of New York.

The visitors were then conducted through the various rooms of the Institute, where Dr. Gibier entered upon explanations of his methods in the preparation of the virus of rabies and upon the preventive method of treatment in hydrophobic cases. Since the opening of the institute a number of persons have been subjected to the treatment, some of them coming from neighboring States and others from the far west.

Dr. Gibier and his assistants intend to demonstrate in the laboratories of the institute, not only the treatment of rabies, but also the nature of all contagious diseases, and especially of anthrax, tuberculosis and glanders, affections upon which they have carefully experimented for several years.

A brilliant success, no doubt, will be accomplished by this noble and beneficent enterprize.

COLLEGE NEWS.

AMERICAN VETERINARY COLLEGE.

The spring session of the American Veterinary College for 1889-'90 closed on the 5th of April. Fifty-two students of the junior, and several members of the senior classes, who have entered upon a three years course, were present. At

the close of the course the class passed an examination on several branches of the curriculum of the junior year, and Mr. E. N. Stout, of Greensburg, Ind., having passed the best examination in anatomy, is to receive the silver medal prize offered by Dr. Liautard.

At the last meeting of the Board of Trustees of the American Veterinary College, on the recommendation of the Faculty, the following appointments were regularly made: Roscoe Bell, D.V.S., Professor of Materia Medica and Therapeutics; James E. Ryder, D.V.S., Professor of Obstetrics; E. F. Brush, M.D., Professor of Bovine Pathology; P. Gibier, M.D., Director of the Biological Laboratory.

THE CHICAGO VETERINARY COLLEGE.

The commencement exercises of the Chicago Veterinary College occurred on March 20, 1890, at the Madison Street Theatre. The attendance was large.

The faculty of the college were present, consisting of A. H. Baker, V.S., Professor of Theory and Practice of Veterinary Medicine, Pathology of Horse, Ox, Sheep, Swine and Dog; R. J. Withers, M.D., V.S., Professor of Obstetrics; Joseph Hughes, M.R.C.V.S., Professor of Veterinary Anatomy, Special and Comparative; E. M. Reading, M.D., Professor of Physiology and Histology; Finley Ellingwood, M.D., Professor of Chemistry; J. F. Ryan, V.S., Professor of Lameness, Diseases of the Feet and Limbs, Practical and Pathological Shoeing; F. S. Billings, Professor of Micro-Histology and Gross Pathology; Percy Clark, M.D., Assistant Demonstrator of Practical Chemistry; Jonathan Periam, Professor of Hygiene, Breeding and General Management of Domestic Animals; C. E. Sayre, D.V.S., Professor of Dental Surgery and Helminthology; A. H. Baker, V.S., Professor of Principles and Practice of Veterinary Surgery; R. J. Withers, M.D., V.S., Professor of Materia Medica and Toxicology.

In the graduating class of fifty gentlemen, eighteen graduated in honor, of these: Dr. J. H. Houston had the highest honors; Dr. J. F. Roe secured the prize in Anatomy and also

in Materia Medica; Dr. T. A. Shipley obtained the prize in Pathology. The names and addresses of the gentlemen who were graduated are:

Walter Allen	Dunlap, Ill.
Fredrick W. Ashe.....	Brooklyn, N. Y.
Hugh Barnes.....	Brimfield, Ill.
Eugene F. Beckley.....	Rockford, Ill.
Major G. Benton.....	Coldwater, Mich.
Levi E. Booth.....	Corydon, Iowa.
John A. Brown.....	Streator, Ill.
Lorenzo D. Browne.....	Donovan, Ill.
Frank E. Burnham.....	Minneapolis, Minn.
Edwin A. Buxton.....	Stockbridge, Wis.
Fredrick J. Burley.....	Galveston, Texas.
Joel E. Cloud.....	Spiceland, Ind.
John W. Connaway.....	Columbia, Mo.
George L. Crocker.....	Maroa, Ill.
Douglas S. Defenbaugh.....	Streator, Ill.
Ira Dilley.....	Roseville, Ill.
Joseph Donovan.....	Marysville, Kan.
Charles T. Eckles.....	Eyota, Minn.
Harrison H. George.....	Napoleon, O.
Theodore T. Green.....	Walworth, Wis.
George G. Grundy.....	Morrisonville, Ill.
Thomas J. Gunning.....	Neponset, Ill.
Charles W. Heitzmann.....	Summi, Miss.
Isaac F. Houston.....	Bathgate, N. D.
John W. Kaull.....	Frankport, Dak.
Elmer H. Kinnett.....	Chapin, Ill.
John W. Lefever.....	Warsaw, Ind.
Willard D. Linn.....	Kings, Ill.
Owen J. McGurty.....	Charleston, Ill.
Christian A. Miller.....	Louisville, Ky.
Clarence Mills.....	Mt. Palatine, Ill.
John H. Miller.....	Malden, Ill.
George T. Netherton.....	Jameson, Mo.
James P. Norton.....	Norwalk, O.
Daniel O'Neill.....	Minneapolis, Minn.
James W. Parkinson.....	Wenona, Ill.
William C. Rayen.....	Nashville, Tenn.
John F. Roe.....	Wabash, Ind.
Joseph F. Roub.....	Monroe, Wis.
Fred. B. Rowan.....	Belvidere, Wis.
Francis S. Schoenleber.....	Chicago, Ill.
Arthur H. Schussler.....	Orland, Ill.
Milton Y. Shaffer.....	Carthage, Ind.

Trajan A. Shipley.....	Ada, O.
Marcus W. Stark.....	East Lemon, Pa.
Francis E. Stone.....	Burlington, Wis.
Nathan I. Stringer.....	Fairbury, Ill.
John C. Tasche.....	Sheboygan, Wis.
William A. Waite.....	Racine, Wis.
Nathaniel P. Whitmore.....	Mazon, Ill.

The junior class of 1889 and 1890 was a large one, and as a rule the examinations for the first year's course were most satisfactory.

BIBLIOGRAPHY.

A NEW MEDICAL DICTIONARY. By George N. Gould, A.B., M.D. (P. Blakiston, Son, & Co., Philadelphia, Pa.)

As medical science advances, and as new medical terms are introduced in scientific phraseology, the publication of such a work as the New Medical Dictionary of Dr. Gould becomes a necessity, and this new work will no doubt, therefore, find its way in all medical libraries. Including numerous new words and phrases, which have been created within the last ten years, especially in the study of bacteriology, ptomaines, leucomaines, electro-therapeutics, embryology and so on, it is claimed that two principal objects have been kept in view, viz., to make the dictionary both scientific and practical. A valuable feature of this work is found in the insertion of sundry tables, which add largely to its usefulness. Amongst these are: abbreviations used in medicine ; one of the arteries, with the name, origin, distribution and branches ; of the bacilli with their habits, characters, cultures, etc. ; of the ganglia ; of the leucomaines ; of the micrococci ; of the muscles ; nerves ; plexuses and ptomaines. The work concludes with several appendices, treating of the mineral springs of the United States, vital statistics, etc. It forms a neat volume of over five hundred pages, and both the busy practitioner and the medical student will find in it abundance of valuable information.

- A PRACTICAL GUIDE TO MEAT INSPECTION. By Thomas Walley, M.R.C.V.S., Principal Edinburgh Royal Veterinary College, Professor of Veterinary Medicine and Surgery, etc., etc. (Young J. Pentland, Edinburgh and London.)

Prof. Walley is already well known to the veterinary profession through the various works he has before published, and principally for his excellent "Four Bovine Scourges." English reading veterinarians are again his debtors for a most valuable little book on the inspection of meat, a subject of primary interest to both the practitioner and sanitarian. Probably this is the first book on the subject in the English language. In the nearly two hundred pages that form this little volume, Prof. Walley has gathered points of the utmost importance, and laid before the investigator his opinions on many interesting matters, and though it may be claimed that "many of the statements must be regarded rather in the light of personal opinions," yet when these are propounded by such reliable authority, they are very nearly equivalent to "dogmatic assertions or to scientifically proved facts."

The various chapters of the book treat, first, of the importance of meat inspection; then, the substitution of the flesh of animals not generally used for human food for the flesh of those thus used; what flesh may be regarded as marketable, and what unmarketable; the rules to be observed in the inspection of meat; the examination of the carcass for the purpose of detecting abnormal conditions; the condition according to the mode of death, or in the various diseases; the constitutional, blood, parasitic, micro-parasitic, zymotic, eruptive affections; the condition of preserved and tinned meats; and with this an excellent and concise examination of the subject of ptomaines. Twenty-eight plates illustrate the work.

It is true that it is only a practical guide and has not the completeness that may be found in some of the works on the same subject, published on the continent, but it is for all purposes as complete a work as it could be made within the small compass which it occupies. English veterinarians will no doubt read with pleasure, and on this side of the Atlantic, where the services of veterinarians as meat inspectors are

still almost entirely ignored, we are sure that it will prove in the hands of our brethren one of the best means of educating themselves in the practical knowledge so essential to the proper performance of such duties, should our health officers ever be brought to realize their value at our hands and call for their performance.

SOCIETY MEETINGS.

LONG ISLAND VETERINARY SOCIETY.

A regular meeting of the Long Island Veterinary Society was held on the above date at No. 74 Adams Street, the President, Dr. Geo. H. Berns, in the chair.

The following members were present: Drs. Berns, R. R. Bell, Bowers, Housman, Decker, Newman, Breslin, Atchison, Pendry.

The minutes of the previous meeting were read and approved.

The Board of Censors made no report.

The Committee on Army Legislation, through its Chairman, Dr. Wm. H. Pendry, reported progress. Dr. Pendry also reported to the Society that a bill was introduced and passed in the Assembly of the State of New York, granting an additional year to non-graduates to register in this State, and it is now awaiting the action of the Senate. He thought the Society should take action upon the subject at once, and for that purpose he introduced the following resolution, which was adopted, viz.:

"That this Society has learned with dismay that an act amending the act regulating the practice of veterinary medicine and surgery, is now before the Legislature of this State, which amendment is for the purpose of granting a further extension of time in which non-graduates will be allowed to practice veterinary medicine, to the detriment of the profession who have qualified themselves in the interest of their profession and the public, and inasmuch as the present law was liberally framed for such non-graduates, and a period given in which they could register, and that time being twice extended by amendments to such act, this Society protests against a further amendment for such purpose as being unfair to the profession, and calculated to work an injury to the public health, as by endless amendments to said act all inducements to qualify for the all-important work of the veterinary profession are removed."

The following committee of three was appointed by the Chair on State Legislation, namely, Drs. Wm. H. Pendry, R. R. Bell, Geo. F. Bowers.

This Committee was appointed with full power, and they shall guard as much as possible the interests of the graduates and the profession in this State, and particularly oppose the extension of time as now proposed for non-graduates to register. The next order of business being reading of papers, Dr. R. R. Bell read a very interesting paper entitled, "Examination of Horses for Soundness," (published in this issue.)

The reading of the paper was followed by quite a discussion, after which a vote of thanks was unanimously tendered to the essayist.

It was moved by Dr. Bell and seconded by Dr. Bowers, that the Secretary have two typewritten copies of the proceedings of the Society made, and forward one each to the AMERICAN VETERINARY REVIEW and *Journal of Comparative Medicine*. Carried.

Moved by Dr. Bowers and seconded by Dr. Newman, that the Secretary order fifty reprints of the proceedings of the Society from the Editor of the AMERICAN VETERINARY REVIEW. Carried.

The Secretary reported that he had communicated with Dr. R. A. McLean as directed in regard to the return of Dr. R. R. Bell's paper on Azoturia, and had failed to receive a reply from the gentlemen up to the present time.

The Chair appointed as essayist for the May meeting, Dr. Samuel Atchison. The meeting then adjourned.

D. S. BRESLIN, D.V.S., *Secretary.*

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the United States Veterinary Medical Association, convening September 16, 1890, will be held in Chicago, Illinois. The committee of arrangements are Drs. Huidekoper, May and Hoskins.

BULLETIN NO. 1.

The Secretary of the United States Veterinary Medical Association begs leave to announce that Prof. Rush Shippen Huidekoper, of Philadelphia, will read an article at the September, 1890 meeting, at Chicago, entitled: "Contraction and Expansion of the Foot, in Health and Disease."

This paper will be illustrated by models and diagrams.

W. HORACE HOSKINS,
Secretary.

NEWS AND SUNDRIES.

ETYMOLOGY OF THE WORD "VETERINARIAN." In his excellent work: *De Verborum Significatione*, of which but little is unfortunately known in its original form, Ferrerius Flaccus, who died in the year 14 A.D., embraces under the common denomination of *Bestia Veterina* all animals that work under the yoke, and makes this word a derivative of *veho* (I pull). According to this, the *veterinarius* was the man who attended to animals of draught of all kinds. Caton is of the same opinion. Opilius thinks that the word comes from the fact that the animal designated by *veterina animalis* carries its head secured to the belly (*ad ventrem onus religatum*) and that it ought to be called *venterina* and not *veterina*. Varro (116 A.D.) is

of the same opinion, including with *ceteæ veterinæ* all other animals of burden. The opinion of Columelle is yet the most plausible; he derives *veterinarius* from *vetus* (aged) because the oldest instructed the youngest men in the treatment of farm animals. He says: *Guarre veterinariæ medicinæ prudens esse debet pecoris magister*. Hensinger finds the derivation of the word in the Sanscrit, an origin which is rather over-drawn.—*Monatssch. I. Ver. d.Thier.*

FAITH CURE IN VETERINARY PRACTICE.—A curious instance of the effects of the Christian Science craze occurred at Eau Claire recently. There is quite a large circle of students of the science in that city, and they hold regular meetings for the discussion of methods and cases. One of the number, a gentleman who resides just out of the city, had a sick horse on his hands. The veterinary surgeons could do nothing for the animal, and the local Christian Science experts failed also. Thereupon the owner of the horse, having plenty of time and not caring for the expense, went to the telegraph office and wired an account of the case to a Christian Science professor in Chicago. The symptoms were given in the telegram, and the Chicago expert was asked to treat the case by the usual method. The horse was at that time apparently on its last legs. The Chicago scientist wired back that he was treating the horse to the best of his ability and was thinking hard. Within five hours the horse was well and eating oats. The case was duly reported at the next meeting of the circle, and the members are pursuing their experiments with renewed faith in the science.

EQUINE LARYNGOSCOPY.—The *Medical Record* of New York is responsible for the following: Prof. Polansky and Dr. Schiaddelka of the Vienna Veterinary School, have constructed a laryngoscope for horses, by means of which active treatment in cases of glanders can be carried out.

A PRACTICE FOR SALE.—Dr. T. Fabian Mayor, of 309 Fulton St., Troy, New York, is about removing to Chicago and offers his practice for sale upon very favorable terms. It seems a good opening for a young graduate.

VETERINARY JOURNAL WANTED.—Dr. C. H. Peabody, of

Providence, offers ten dollars for the first volume of Fleming's Veterinary Journal, bound or unbound.

\$400 IN PRIZES—IMPORTANT TO BIOLOGICAL STUDENTS.

NORWAY LAKE, ME., January 17th, 1890.

American Veterinary Review:

I shall esteem it a great courtesy if you can make a brief news item of the offer of prizes, the circular of which I venture to inclose to you. Many veterinary surgeons have opportunities to make observations of the kind specified in this offer. The enterprise is in no sense a commercial one; I am simply anxious to collect all the facts touching failing nutrition and waning vital power in aged organisms.

Very truly yours

C. A. STEPHENS.

From a desire to verify his own researches as to the causes of failing nutrition in aging organisms, the undersigned hereby offers three cash prizes of \$175, \$125 and \$100 for the best three comparative demonstrations, by means of microscopical slides, of the blood capillaries in young and in aged tissues, canine or human.

By young tissues (canine) are meant tissues from animals between the ages of one and three years.

By aged tissues (canine) are meant tissues from animals not less than twelve years of age.

By young tissues (human) are meant tissues from subjects between the ages of ten and twenty years.

By aged tissues (human) are meant tissues from subjects not less than sixty-five years of age.

While a preference will be given to demonstrations from human tissues, it will be possible for work in canine tissues to take the first and, indeed, all of the prizes. But of two slides equally well done in all respects, one canine, the other human, the latter will be given the preference. Canine tissues should be from large animals.

Twelve slides from young and twelve from aged tissues must be submitted by each competitor, together with a full description of the subject, methods pursued and every detail

and circumstance which is likely to throw light upon, or account for any peculiarity. The slides are for comparison as to the condition of capillary circulation, the young with the old, and should be in numbered pairs, or groups from the same kind of tissue. The term tissue is used in a general sense, e. g., pulmonary tissue, hepatic tissue, renal tissue, osseous tissue, muscular tissue, nerve tissue, alimentary tissue, etc.

No particular schedule of methods for injection, or staining, will be insisted upon, and no more definite directions, or explanations will be given.

The slides, carefully packed and boxed, together with descriptive manuscript, can be sent by mail.

It is stipulated that the demonstrations which receive the prizes shall become the property of the subscriber, for publication. All others will be returned, if desired.

No pseudonyms required. Accompany slides in every case, with (real) name and address. Unless of known reputation as a biologist, a reference is respectfully solicited.

Reservation: no award will be made unless work of at least ordinary merit is submitted.

This offer is made on the first day of January, 1890, and will remain open until the twentieth day of August, 1890.

Slides and manuscript will be examined and receipted for as soon as received.

The prizes will be adjudged on the first day of October, 1890.

These nominal prizes are offered less in expectation of result from the money as an agent, than in the hope that the offer may furnish a *point d'appui* for really needed work. Besides professional observers and students, there are in the United States a large number of amateur microscopists of acute vision and undoubted talent, who are at present playing with microscopes, as with toys, merely to see curious or pretty things. The time has come to concentrate observation upon the one proper object of biology, viz., the renovation and prolongation of human life. Address C. A. Stephens' Laboratory, Norway Lake, Maine.